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14. ABSTRACT The DoD Acquisition Process is continually changing, implementing various reform initiatives, and adjusting to a new fiscal environment. The role of Test and Evaluation (T&E) in this process is also changing. The ability of the T&E community to adapt to these changes will have a major impact on its ability to support the acquisition community and the warfighter. The Defense Systems Management College's (DSMC) Advance Program Management Course (APMC) provides many future Program Managers (PM's) with the only formal T&E education they will receive. This paper will discuss what DSMC is teaching in the area of T&E. APMC also relies on students briefing their own T&E experiences, videos, and Defense T&E Professional Institute (DTEPI) CDs to supplement the curriculum. This paper will provide some insight by describing issues that surfaced with T&E and PM's and the author's suggested actions to improve the relationship between the T&E community and PM's. This paper will also provide an overview of some changes to the acquisition process along with the impact to T&E. DoD will soon release and update to DoD 5000 that will place further emphasis on evolutionary acquisition and the use of experimentation, Advanced Concept Technology Demonstration (ACTD), Advanced Technology Demonstration (ATD), and Modeling and Simulation.					
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The Impact of Acquisition Issues and Training on Test and Evaluation

The Education of Future Program Managers at DSMC



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ABSTRACT

The Department of Defense (DoD) Acquisition Process is continually changing, implementing various reform initiatives, and adjusting to a new fiscal environment. The role of Test and Evaluation (T&E) in this process is also changing. The ability of the T&E community to adapt to these changes will have a major impact on its ability to support the acquisition community and the warfighter.

The Defense Systems Management College's (DSMC) Advance Program Management Course (APMC) provides many future Program Managers (PMs) with the only formal T&E education they will receive. This paper will discuss what DSMC is teaching in the area of T&E. APMC also relies on students briefing their own T&E experiences, videos, and Defense Test and Evaluation Professional Institute (DTEPI) CDs to supplement the curriculum. Is this education producing Program Managers that value the role of T&E and who assure adequate schedule and funds are allocated to T&E? Or, does it produce Program Managers that view T&E as a risk and minimize the schedule and funds for T&E?

One of the best learning tools of the 14-week APMC class was provided through discussions of real experiences of students and teachers. These experiences ranged from no experience to vast experience and from very good to very bad. Can these experiences provide the T&E community with a view on how their recent and future T&E customers feel about T&E? Are the bad experiences of a few providing a negative impression to many? Could feedback from these students provide the T&E community with information that could help improve relationships with PMs? Should changes be made to the T&E information in the APMC curriculum? Insight into the education and experiences of the T&E community's future customers provided a unique opportunity to both analyze and address these issues in an educational environment. This paper will provide some insight by describing issues that surfaced with T&E and PMs and the author's suggested actions to improve the relationship between the T&E community and PMs.

This paper will also provide an overview of some changes to the acquisition process along with the impact to T&E. DoD will soon release an update to DoD 5000 that will place further emphasis on evolutionary acquisition and the use of experimentation, Advanced Concept Technology Demonstration (ACTD), Advanced Technology Demonstration (ATD), and Modeling and Simulation.

Background

Defense Systems Management College

The Defense Systems Management College (DSMC) was founded in 1971 at Fort Belvoir, Virginia. DSMC provides systems acquisition education and training for the weapon systems acquisition professionals. This education trains military officers and civilians for their roles in program management and other acquisition positions. DSMC is a part of the Defense Acquisition University (DAU).

The college faculty is divided into eleven departments. These departments are the Acquisition Policy Department, Contractor Finance Department, Contract Management Department, Earned Value Management Department, Funds Management Department, Logistics Management Department, Manufacturing Management Department, Program Management and Leadership Department, Systems Engineering Management Department, Software Management Department, and the Test and Evaluation Engineering Department.

The Test and Evaluation (T&E) Department consists of six full-time and two part-time instructors. The instructors represent all three Services (five Air Force, one Navy, and two Army). They have both Developmental Testing (DT) and Operational Testing (OT) backgrounds though it is more oriented towards DT. The department is responsible for teaching all three T&E courses (TST101, TST201, & TST301) along with the T&E portions of the Program Management courses (ACQ201 & PMT302), the Executive Program Manager's Course (EPMC), and the Defense Acquisition Executive (DAE) Overview Workshop. They, with review by a T&E Functional Board, update course materials for each of these courses. They also publish the Test and Evaluation Management Guide.

Advanced Program Management Course

The Advanced Program Management Course (APMC) provides training on all aspects of systems acquisition. (See Appendix A for Course description) Areas of emphasis include: program management and leadership, defense acquisition policy, contractor finance, earned value management, contract management, funds management, logistic management, manufacturing management, software management, systems engineering management, test and evaluation, and international cooperative development. This class is required for a Level III Defense Acquisition Workforce Improvement Act (DAWIA) certification in Program Management.

APMC is a 14-week class held three times a year at Fort Belvoir. The class consists of approximately 360 students. To facilitate this large size, the class is divided into sections of thirty students (five teams of six students per classroom). Students are from throughout DoD, its agencies, the services, and includes industry participants.

Discussion

Teaching Approach

The faculty compliments the readings and lectures with real life examples, exercises, student experiences and briefings, guest lectures, student specific training and an "acquisition"

project. Each student is required to develop their own section of training designed to address specific issues or areas of improvement. This 40-hour section can utilize a series of classes at the school, resources from the DSMC Learning Resource Center (LRC) or the DSMC Library, field trips, or other individual learning methods. The LRC contains a broad array of videos, audios, taped lectures, CDs, and other media. (See Appendix B for entire list in the T&E category)

The Stored Energy Ground Vehicle (SEGV) project, also known as the mousetrap project, requires each team to implement what they have learned. Each team acts as the contractor on a defense weapons systems acquisition. Based on the constraints and guidance of the Contract, a package of Government Furnished Equipment, and a supplied modeling and simulation design tool, each team manages, designs, builds, tests, and delivers a vehicle that is powered by a mousetrap. Final "contract award" for each classroom is based on how the design met cost goals and performance requirements based on an operational test.

The approach for the T&E curriculum is to show how T&E fits into the overall acquisition strategy. The DoD and Service's T&E organizations, policies, rules, and regulations are covered. Emphasis is placed on how T&E reduces risks and assures the warfighter gets a weapons system that is ready for use. The T&E faculty also addresses new and evolving issues related to T&E, such as the use of modeling and simulation.

Issues with T&E

APMC provides a unique opportunity to hear opinions and issues on T&E from a wide variety of "customers." Students are encouraged to participate in the lectures by describing their experiences. This can be as informative as the rest of the curriculum. These experiences can be either positive or negative. The issues presented here are based solely on the author's observations as an APMC student (APMC 99-3) and discussion with other students and one T&E faculty member. Although this is not a thorough investigation, it does show that the APMC students (the future Program Managers) have a variety of issues with the T&E community.

The following are some of the major issues that were discussed. They are not discussed in detail or with the specific examples used in the class. Whether any of these concerns are right or wrong are not subject to debate since they are the perceptions of these students, however as the saying goes, perception is reality.

Timeliness

One issue was the length of time that it took the T&E community to provide test results. This was discussed in different contexts. By the time the test results (and the subsequent cause) are known, it is often too late to fix the problem without severe impact to cost and schedule (note: opposite issue is presented in next section). Another complaint was the time that it took for formal reports to be published. The most vocal complaint was directed toward the Director, Operational Test & Evaluation (DOT&E) office. This particular issue was with the DOT&E office not providing a program with adequate feedback on the OT results before a milestone review and then delivering the OT report, with surprises, virtually at the review.

Test Realism

There were complaints that the test community required tests that were not realistic and were conducting testing just for the sake of testing. Another issue was that warfighter use and acceptance in a real world operation was sometimes discounted because the "war wasn't realistic

enough." The high level reason for testing seemed to be understood but not the reason for specific test requirements.

Cost

Not surprisingly, cost was an issue. In today's environment of treating cost independently, trade-offs of schedule and performance will be performed even more often. Unless Program Managers (PMs) fully understand the reason for T&E costs, they will not have information necessary to make these trade-offs.

Test Range Size/Capability

The ability to adequately test state of the art weapon systems requires more extensive test capabilities and a greater range area. There was concern with how to adequately test weapon systems that were evolving faster than test capabilities. The reliance on "networked" weapon systems even further complicates testing.

Incremental Acquisition/Acquisition Reform

There are concerns that the T&E community is stuck in a paradigm where a program builds the whole system, it is tested, and then it is delivered. This is changing in a number of ways where a "build a little, test a little" approach is preferred. Changes in DoD 5000 will make this an even bigger issue. Some students thought that the T&E community had not adjusted to changes in the Acquisition process.

OT

The harshest perception of the T&E community was directed at the OT area. The role, responsibility, reporting chain, and goal of OT was taught and understood. But, there was a very limited but most vocal perception that this area is inflexible and can be bureaucratic. These more vocal discussions had a big impact on other students and will be remembered. However, the author's opinion is that the perception is based on one bad exposure or misunderstanding coupled with a lack of knowledge of the new DOT&E organization.

Issues with Program Managers

The type of issues that Program Managers (PMs) have with the T&E community is very useful to know, but it is equally important to take a reverse look at this. By examining the issues that members of the T&E community sometimes have with PMs and compare it to the PM's issues and the PM's training in T&E, opportunities present themselves to improve not only the PM training but the relationship between T&E and PMs. Again, the items discussed here are those captured by the author and are represent only some of those mentioned.

Limited T&E Involvement Early in Program

This issue has been around since the slide rule days and will probably never go away. While Integrated Program Teams (IPTs) have solved many problems, there still seems to be opportunities that are missed because the "right" people were not involved early. One example is early involvement of the OT community.

Reduction to T&E Funding and Schedule

It is perceived by some that a Program Manager will reduce the Funding and Schedule allocated to T&E before impacting any other parts of the program. While in reality, typical PMs will probably impact most areas of their program before delivery, this does raise an issue of how T&E fits into today's acquisition cycle. The use of Cost As an Independent Variable (CAIV) is being pushed as a tool for maintaining cost control of programs. This theory separates cost and asks the Program Manager to trade schedule and performance while maintaining cost. How does a Program Manager weigh a particular test or series of tests versus reducing performance or impacting schedule? How well a Program Manager understands T&E will be a key when they have to make these trade-offs.

Impact to the Design

In the past, passive techniques were predominately used for test or training instrumentation for aircraft. While the aircraft was instrumented for DT and training, the instrumentation was usually not a part of aircraft used for OT. Current trends are blurring the lines between DT, OT and Training. In the future, embedded test and training capabilities designed into the aircraft for use throughout its life is the goal. This goal will require a major paradigm shift from both communities.

T&E as a Risk Reduction Tool

How do PMs view T&E? PMs who have programs impacted by issues raised in T&E or even canceled for failing OT, do see T&E as a RISK! While DSMC teaches that T&E should be viewed as a Risk Reduction Tool, it is hard to convince many of this. An example is when one program briefed the entire APMC class. A student asked the presenter why they had so much time allocated for T&E. The answer was that they viewed their T&E program as an important way of reducing risk by planning to feed T&E results back into the development process and assuring there was adequate time to accomplish this. This attitude needs to be a goal for how all PMs view T&E.

Current Acquisition Issue/Changes

The acquisition area is always changing to be able to provide the warfighter with weapon systems that are better, produced at less cost, and fielded quicker. There are some issues and changes that are important to the T&E community. The latest is the update of the DoD 5000 series Instructions. This update addresses recommendations from the Section 912 studies (Studies conducted in response to Section 912 of the National Defense Authorization Act for FY98 and reported back to Congress) and is intended to reduce cost, reduce cycle time, and increase performance. In the new acquisition model, there will be increased involvement of the Science and Technology community and the use of Advanced Concept Technology Demonstration (ACTDs) and Advanced Technology Demonstrations (ATDs) during the early parts of a program's life. The other key item is that the preferred approach will be to field a system that meets the user's minimum needs and have preplanned block upgrade evolution that leads up to a full capability.

Opportunities

By taking a closer look at the views of APMC students, the T&E community has an opportunity to identify issues that PMs have with T&E. This leads to an opportunity to be proactive and do something to address them. The following is a list of the author's suggested actions.

Provide DSMC with:

- Examples of testing including reasons why they were conducted
- Successful T&E/PM efforts
- Lessons Learned (& Relearned)
- Problem areas that require additional concentration
- Briefings by senior T&E Leadership
- Additions to the Learning Resource Center
- Develop, with DSMC, a method of gathering and addressing issues from students
- Monitor and continually address these issues

Summary

DSMC's APMC course is the training ground for future PMs. It also represents an opportunity for the T&E community to gain insight and address issues that they have. The acquisition community is continually changing and the T&E community must stay aware of this and adapt to the new environment. By working with DSMC, the T&E community can take a few easy steps to help improve the relationship between PMs and T&E.

Appendix A

Advanced Program Management Course [PMT 302]

The Advanced Program Management Course (APMC) provides a comprehensive examination of the integrated process used in systems acquisition management. The primary objective of the course is to enhance the learner's performance in current and future acquisition related positions. This objective is achieved by building upon knowledge gained through intermediate level (Level II) formal education, training, and experience. A key focus of the course is to expose the learners to current and emerging issues in the DoD's Acquisition Reform initiative as well as other policy and legislative changes that make acquisition management an extremely dynamic environment.

The APMC course uses a variety of instructional methods. The primary APMC learning methodology is faculty-assisted, student-led, small-group cases and exercises. The course also features distinguished guest lecturers from both government and industry, instructor-led lecture/discussion sessions, experiential learning projects and a diverse collection of electives. The importance of developing and managing effective integrated teams is emphasized. Students are organized into integrated product/process teams during the cases and exercises. Subject areas in PMT 302 include: program management and leadership, defense acquisition policy, contractor finance, earned value management, contract management, funds management, logistic management, manufacturing management, software management, systems engineering management, test and evaluation, and international cooperative development.

The course incorporates a variety of programs to enrich the DSMC learning experience: (1) Interdisciplinary exercises enhance the integration of the functional area disciplines, provide an experiential learning process, and challenge students to apply and integrate subject areas while using quality tools and integrated process and team concepts. (2) The individual learning program allows students to tailor the course to meet their individual learning needs. Students develop an individual learning plan to use resources like the DSMC Acker Library, the DSMC Learning Resource Center, faculty, other students, and local experts to acquire varied skills and knowledge in elective classes and self-study. Electives offer the students the unique opportunity to explore acquisition areas in greater detail than the core curriculum. (3) Through the Capitol Hill Program, students learn how congressional activities impact acquisition management; study the operations of the Congress; receive briefings on current congressional activities and issues; and participate in a 1-day field trip to Capitol Hill.

Appendix B

T&E Resources in the Learning Resource Center

CRITERIA DEVELOPMENT FOR C-17 OPERATIONS ON SEMI-PREPARED AIRFIELDS

TE 07 (1 Video, 5 Mins) U.S. Army Cold Regions Research & Engineering Lab

Discusses the criteria that was identified in August 1996 for the C-17 Semi-Prepared and Matted Runways Efforts.

HIGH PERFORMANCE COMPUTING: IMPACT ON THE WARFIGHTER

TE 08 (1 Video, 5 Mins)

Shows how high performance computing was used on the Sense and Destroy Armor (SADARM) Missile.

LIVE FIRE TEST AND TRAINING INITIATIVE

TE 04 (1 Video, 9 Mins) Jardon and Howard Technologies, Inc.

Provides a quick insight into what the live fire test and training initiative is all about.

LIVING WITH LIVE FIRE

TE 01 (1 Video, 22 Mins) Comprehensive Technologies International

A synopsis to weapons systems development for Program Managers, Defense Acquisition Executives and contractors on how to prepare live fire test and evaluation strategies and other details relating to implementation of live fire testing and law. Extensive footage on actual live fire testing.

LIVING WITH LIVE FIRE: PUTTING LIVE FIRE TEST AND EVALUATION GUIDELINES INTO PRACTICE

TE 03 (1 Video, 22 Mins)

Office of the Director, Operational Test And Evaluation, The Pentagon

A synopsis of weapons systems development for PM's, Defense Acquisition Executives and contractors on how to prepare live fire T&E strategies and other details relating to implementation of live fire testing and law.

MARTIN MARIETTA REAL 3D

TE 06 (1 Video, 13 Mins) Martin Marietta

Discusses Martin Marietta's Real 3D technology, Simulation Heritage, and has short clips of the R3D/100 Chip Set and Simulation Heritage.

MLRS WE'RE IN THE ARMY NOW

TE 14 (1 Video, 15 Mins) Cinematics - LTV Aerospace & Defense

Discusses the testing and evaluating of the Multiple Launch Rocket System (MLRS).

OPERATIONAL EFFECTIVENESS AND SUITABILITY AND LIVE FIRE TESTING

TE 16 (1 CD-ROM, Time Varies) Defense Test and Evaluation Institute (DTEPI)

The purpose of this program is to familiarize you with the terminology and thought processes

used in formulating operational effectiveness and suitability test scenarios, and also provides an outline of the Live Fire Test and Evaluation Program.

RANGE TIME '97 EDITION X

TE 10 (1 Video, 17 Mins) Naval Air Warfare Center

Programs included: Alternate Air Launch Capability for Ballistic Targets, Gator Mine Lot Acceptance Testing, Suborbital Research Rockets, JDAM Developmental Testing, GPS Aided Munition - BLU-113, and more.

RANGE TIME '98 EDITION III

TE 11 (1 Video, 16 Mins) Naval Air Warfare Center

Programs included: Wind Corrected Munitions Dispenser (B-52), JDAM/F/A-18 Developmental Testing, JDAM/B-52 Integration, Suborbital Rockets, Predator, "Profile" - Virtual Range Update, and Land Rover.

RANGE TIME '98 EDITION VIII

TE 12 (1 Video, 12 Mins) Naval Air Warfare Center

Programs included: JDAM/B-2, Standard Missile 2 Block IIIA, F-117 Proficiency Training, Confined Burn - Motor Demilitarization, SLAM ER DT 5, and SLAM ER Warhead.

RANGE TIME '98 EDITION X

TE 13 (1 Video, 10 Mins) Naval Air Warfare Center

Programs included: SLAM ER Warhead Live Fire, Squadron Training Maverick/Walleye, Suborbital Research Rockets, Wind Corrected Munitions Dispenser (WCMD), MAWTS-1 HARM EX, and more.

SQUADRON HISTORICAL

TE 15 (1 Video, 1 Hr) 46th Test Wing Visual Information Support Center

Historical collection of AMRAAM guided missile launches.

TARGETS 1998 UPDATE

TE 09 (1 Video, 11 Mins) STRICOM PM ITTS

Targets Management Office (STRICOM PM ITTS) is responsible for the development, acquisition, and deployment of Army Defense training and test as well as target flight services and engineering services management.

TIME SPACE-POSITION INFORMATION (TSPI)

TE 02 (1 CD-ROM, 16 Hrs) DTEPI

This is a multimedia course presented by the Defense Test and Evaluation Professional Institute (DTEPI). For further information contact (DTEPI) 805-989-7947, DSN 351-7947.

TMD SYSTEM EXERCISER

TE 05 (1 Video, 12 Mins) U.S. Army Peo - Air and Missile Defense Technical Support Directorate

Discusses the Theater Missile Defense System Exerciser



The Impact of Acquisition Issues on T&E

The Education of Future Program Managers at DSMC

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Background



- What is DSMC/APMC?
 - Defense Systems Management College
 - Founded 1971
 - Systems Acquisition Training
 - Advance Program Management Course
 - 14 week course at Fort Belvoir, VA
 - 12 Topic Areas, including T&E
 - 360 Students per session, 12 classrooms of 30 students
 - Required for DAWIA Level III PM certification



DSMC T&E Faculty



- Current Staff
 - Size: 6 full-time, 2 part-time
 - Diverse Experience: All Services, DT & OT
- Staff Responsibilities:
 - Teach T&E courses
 - Teach T&E for PM and executive courses
 - Update Course Materials/T&E Management Guide



Teaching Approach



- Lecture/Readings
 - How T&E fits into the overall acquisition strategy
 - Policy
 - Issues involved with T&E (e.g., use of M&S)
- Teacher and Student Experiences used
- Group exercises/project
- Additional 40 Hrs via Learning Resource Center & seminars



Issues with T&E

(from the PM perspective)



- Data turn around
 - Too long for analyses and reports
- Realism
 - Tests aren't realistic; Testing for testing sake
- Cost
 - Too high; They don't understand why
- Range Size/Capability
 - New weapon systems exceed size/capability of ranges



Issues with T&E

(from the PM perspective)



- Incremental acquisition testing
 - No adjustment in T&E to address incremental buys
 - “Build a little, test a little”
- T&E hasn’t Adjusted to Acquisition Reform
 - No changes/improvements seen in T&E
- DOT&E
 - Inflexible
 - “Out to get the programs”



Issues with PMs

(from the T&E perspective)



- Limited early T&E involvement
- First area to reduce funding and schedule
- Unable to embed test capability
- T&E is not seen as a risk reduction tool for PM, seen AS A RISK



DoD 5000 Update



- Addresses Section 912 recommendations
- Intended to reduce cost and cycle time, increase performance
- Increased S&T involvement, use of ACTDs
- Later Program Start
- Initial Build for minimal needed capability
- Preplanned Block Upgrades leading to FOC



Improvement Opportunities



- Provide DSMC T&E Department with:
 - Examples of Testing
 - Successful T&E/PM efforts
 - Lessons Learned & Relearned
 - Problem Areas that require additional emphasis
 - Briefing by senior T&E Leadership
 - Material for Learning Resource Center



Additional Opportunity



- Gather and Address Student Issues
 - Develop process with DSMC
 - Gather student's Issues and experiences
 - Provide information/expertise
 - Monitor progress
 - Continual improvement



Summary



- DSMC is training ground for PMs
- Opportunity to gauge attitudes and issues of PMs
- Acquisition is continually changing
- Changes impact Test and Evaluation
- Increased T&E Community involvement with DSMC could help improve future PM/T&E relationships



Questions?